



# SEQUENCE LISTING

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IIJIMA, SHIGEYUKI  
FUKUSHIMA, NAOSHI  
TSUCHIYA, MASAYUKI

<120> HUMANIZED ANTI-CD47 ANTIBODY

<130> 060641-0113

<140> 10/578,840

<141> 2006-05-10

<150> PCT/JP2004/016744

<151> 2004-11-11

<150> JP 2003-381406

<151> 2003-11-11

<160> 122

<170> PatentIn version 3.5

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<223> Description of Artificial Sequence: Synthetic polynucleotide

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gtgtccactc ccaggtgcag ctggtgcagt ctggggctga ggtgaagaag cctggggcct 120

cagtgaaggt ttc 133

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<211> 133

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic polynucleotide

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tcaaggacag agtcacgatg acccgggaca cgtccacgag cacagtctac atggagttga 120

gcagtctcag atc 133

<210> 3

<211> 133

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic polynucleotide

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gaataacatg gttggcgaag gtgtatccag atgccttaca ggaaaccttc actgaggccc 120

caggcttctt cac 133

<210> 4

<211> 133

<212> DNA

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<223> Description of Artificial Sequence: Synthetic polynucleotide

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cgcggtacca ctcacctgag gagacggtga ccagggttcc ttggccccag tcgtcgtaag 60

tatagtaacc ccctctagca caataataga cggccgtgtc ctcagatctg agactgctca 120

actccatgta gac 133

<210> 5

<211> 23

<212> DNA

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<223> Description of Artificial Sequence: Synthetic primer

<400> 5

cccaagcttc caccatggaa tgg 23

<210> 6

<211> 23

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic primer

<400> 6

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<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic plasmid  
polynucleotide

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gtc cac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag 96  
 Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
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cct ggg gcc tca gtg aag gtt tcc tgt aag gca tct gga tac acc ttc 144  
 Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
 15 20 25

gcc aac cat gtt att cac tgg gtg cga cag gcc cct gga caa ggg ctt 192  
 Ala Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu  
 30 35 40 45

gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat 240  
 Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
 50 55 60

gag aag ttc aag gac aga gtc acg atg acc cgg gac acg tcc acg agc 288  
 Glu Lys Phe Lys Asp Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser  
 65 70 75

aca gtc tac atg gag ttg agc agt ctc aga tct gag gac acg gcc gtc 336  
 Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val  
 80 85 90

tat tat tgt gct aga ggg ggt tac tat act tac gac gac tgg ggc caa 384  
 Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
 95 100 105

gga acc ctg gtc acc gtc tcc tca ggtgagtgga tccgcg 424  
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<210> 8  
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<220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

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<210> 9

<211> 18

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic oligonucleotide

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<211> 424

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic plasmid  
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48

gtc cac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag  
Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
-1 1 5 10

96

cct ggg gcc tca gtg aag gtt tcc tgt aag gca tct gga tac acc ttc  
Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
15 20 25

144

gcc aac cat gtt att cac tgg gtg cga cag gcc cct gga caa ggg ctt  
Ala Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu  
30 35 40 45

192

gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat  
Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
50 55 60

240

gag aag ttc aag gac aga gtc acg atg acc tca gac acg tcc acg agc  
Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Thr Ser  
65 70 75

288



atg gaa tgg agc tgg ata ttt ctc ttc ctc ctg tca gga act gca ggt	48
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-15 -10 -5	
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Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys	
-1 1 5 10	
cct ggg gcc tca gtg aag gtt tcc tgt aag gca tct gga tac acc ttc	144
Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe	
15 20 25	
acc aac cat gtt att cac tgg gtg cga cag gcc cct gga caa ggg ctt	192
Thr Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu	
30 35 40 45	
gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat	240
Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn	
50 55 60	
gag aag ttc aag gac aga gtc acg atg acc tca gac acg tcc acg agc	288
Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Thr Ser	
65 70 75	
aca gtc tac atg gag ttg agc agt ctc aga tct gag gac acg gcc gtc	336
Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val	
80 85 90	
tat tat tgt gct aga ggg ggt tac tat act tac gac gac tgg ggc caa	384
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln	
95 100 105	
gga acc ctg gtc acc gtc tcc tca ggtgagtgga tccgcg	424
Gly Thr Leu Val Thr Val Ser Ser	
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<210> 14  
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<220>  
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<210> 15  
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<210> 16  
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 -15 -10 -5

gtc cac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag 96  
 Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
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cct ggg gcc tca gtg aag gtt tcc tgt aag gca tct gga tac acc ttc 144  
 Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
 15 20 25

gcc aac cat gtt att cac tgg gtg cga cag gcc cct gga caa ggg ctt 192  
 Ala Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu  
 30 35 40 45

gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat 240  
 Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
 50 55 60

gag aag ttc aag gac aaa gtc acg atg acc tca gac acg tcc acg agc 288  
 Glu Lys Phe Lys Asp Lys Val Thr Met Thr Ser Asp Thr Ser Thr Ser  
 65 70 75

aca gtc tac atg gag ttg agc agt ctc aga tct gag gac acg gcc gtc 336  
 Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val  
 80 85 90

tat tat tgt gct aga ggg ggt tac tat act tac gac gac tgg ggc caa 384  
 Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
 95 100 105

gga acc ctg gtc acc gtc tcc tca ggtgagtggg tccgcg 424  
 Gly Thr Leu Val Thr Val Ser Ser  
 110 115

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<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 17
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39

<210> 18
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 18
cgtgactctg tccttgaa
18

<210> 19
<211> 424
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic plasmid
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<220>
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Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly
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48

gtc cac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag
Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys
      -1  1              5              10
96

cct ggg gcc tca gtg aag gtt tcc tgt aag gca tct gga tac acc ttc
Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe
      15              20              25
144

gcc aac cat gtt att cac tgg gtg cga cag gcc cct gga caa ggg ctt
Ala Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu
      30              35              40              45
192

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gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat	240
Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn	
50 55 60	
gag aag ttc aag gac aga gtc acg ctg acc tca gac acg tcc acg agc	288
Glu Lys Phe Lys Asp Arg Val Thr Leu Thr Ser Asp Thr Ser Thr Ser	
65 70 75	
aca gtc tac atg gag ttg agc agt ctc aga tct gag gac acg gcc gtc	336
Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val	
80 85 90	
tat tat tgt gct aga ggg ggt tac tat act tac gac gac tgg ggc caa	384
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln	
95 100 105	
gga acc ctg gtc acc gtc tcc tca ggtgagtgga tccgcg	424
Gly Thr Leu Val Thr Val Ser Ser	
110 115	

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 <223> Description of Artificial Sequence: Synthetic oligonucleotide

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<210> 21  
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 <212> DNA  
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 <223> Description of Artificial Sequence: Synthetic oligonucleotide

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<210> 22  
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 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
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<220>  
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<220>

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<221> CDS
<222> (1)..(408)

<220>
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<222> (58)..(408)

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Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly
               -15                      -10                      -5

gtc cac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag      96
Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys
               -1  1                      5                      10

cct ggg gcc tca gtg aag gtt tcc tgt aag gca tct gga tac acc ttc      144
Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe
               15                      20                      25

acc aac cat gtt att cac tgg gtg cga cag gcc cct gga caa ggg ctt      192
Thr Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu
               30                      35                      40                      45

gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat      240
Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn
               50                      55                      60

gag aag ttc aag gac aga gtc acg atg acc tca gac acg tcc acg agc      288
Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Thr Ser
               65                      70                      75

aca gtc tac atg gag ttg agc agt ctc aga tct gac gac acg gcc gtc      336
Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val
               80                      85                      90

tat tat tgt gct aga ggg ggt tac tat act tac gac gac tgg ggc caa      384
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln
               95                      100                      105

gga acc ctg gtc acc gtc tcc tca ggtgagtgga tccgcg      424
Gly Thr Leu Val Thr Val Ser Ser
110                      115

<210> 23
<211> 35
<212> DNA
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<210> 24
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<212> DNA
<213> Artificial Sequence

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<220>  
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 <211> 43  
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 <223> Description of Artificial Sequence: Synthetic oligonucleotide  
  
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 <211> 19  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide  
  
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 <210> 27  
 <211> 18  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide  
  
 <400> 27  
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 <210> 28  
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 <223> Description of Artificial Sequence: Synthetic oligonucleotide  
  
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 <210> 29  
 <211> 20  
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<220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 29  
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<210> 30  
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<220>  
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<220>  
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<220>  
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gtc cac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag 96  
 Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
 -1 1 5 10

cct ggg gcc tca gtg cag gtt tcc tgt aag gca tct gga tac acc ttc 144  
 Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
 15 20 25

acc aac cat gtt att cac tgg ctg cga cag gcc cct gga caa ggg ctt 192  
 Thr Asn His Val Ile His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu  
 30 35 40 45

gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat 240  
 Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
 50 55 60

gag aag ttc aag gac aga gtc acg atg acc tca gac acg tcc atc agc 288  
 Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser  
 65 70 75

aca gcc tac atg gag ttg agc agt ctc aga tct gac gac acg gcc gtc 336  
 Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val  
 80 85 90

tat tat tgt gct aga ggg ggt tac tat act tac gac gac tgg ggc caa 384  
 Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
 95 100 105

gca acc ctg gtc acc gtc tcc tca ggtgagtgga tccgcg 424  
 Ala Thr Leu Val Thr Val Ser Ser  
 110 115

<210> 31  
 <211> 130  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic polynucleotide

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<210> 32  
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<220>  
 <223> Description of Artificial Sequence: Synthetic polynucleotide

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 aggggtggagg 130

<210> 33  
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<220>  
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 gcagggagag 130

<210> 34  
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 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic polynucleotide

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 gtgtgaaatc 130

<210> 35  
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 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 35  
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<210> 36  
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 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 36  
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<210> 37  
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 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
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<220>  
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 <222> (1)..(60)

<220>  
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 <222> (1)..(396)

<220>  
 <221> mat\_peptide  
 <222> (61)..(396)

<400> 37  
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Pro	Gly	Gln	Ser	Pro	Arg	Arg	Leu	Ile	Tyr	Lys	Val	Ser	Asn	Arg	Phe		
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Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe		
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Thr	Leu	Lys	Ile	Ser	Arg	Val	Glu	Ala	Glu	Asp	Val	Gly	Val	Tyr	Tyr		
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Cys	Ser	Gln	Ser	Thr	His	Val	Pro	Tyr	Thr	Phe	Gly	Gln	Gly	Thr	Lys		
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Leu	Glu	Ile	Lys														
			110														

<210> 38  
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<220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 38  
 ccaggccaat ctccaaggct cctaatttat aaagtttcc 39

<210> 39  
 <211> 18  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 39  
 ccttgagat tggcctgg 18

<210> 40  
 <211> 412  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
 polynucleotide

<220>  
 <221> sig\_peptide  
 <222> (1)..(60)

<220>  
 <221> CDS  
 <222> (1)..(396)

<220>  
 <221> mat\_peptide  
 <222> (61)..(396)

<400> 40  
 atg agg ctc cct gct cag ctc ctg ggg ctg cta atg ctc tgg gtc cca 48  
 Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
 -20 -15 -10 -5  
 ggc tcc agt ggg gat gtt gtg atg act cag tct cca ctc tcc ctg ccc 96  
 Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
 -1 1 5 10  
 gtc acc ctt gga cag ccg gcc tcc atc tcc tgc aga tca agt cag agc 144  
 Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
 15 20 25  
 ctt gtg cac agt aat gga aag acc tat tta cat tgg ttt cag cag agg 192  
 Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Phe Gln Gln Arg  
 30 35 40  
 cca ggc caa tct cca agg ctc cta att tat aaa gtt tcc aac cga ttt 240  
 Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe  
 45 50 55 60  
 tct ggt gtc cca gac aga ttc agc ggc agt ggg tca ggc act gat ttc 288  
 Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
 65 70 75  
 aca ctg aaa atc agc agg gtg gag gct gag gat gtt gga gtt tat tac 336  
 Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr  
 80 85 90  
 tgc tct caa agt aca cat gtt ccg tac acg ttt ggc cag ggg acc aag 384  
 Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys  
 95 100 105  
 ctg gag atc aaa cgtgagtgga tccgcg 412  
 Leu Glu Ile Lys  
 110

<210> 41  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence

<220>



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<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 41
gaggatgttg gagtttattt ctgctctcaa agtacacat
39

<210> 42
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 42
ataaactcca acatcctc
18

<210> 43
<211> 412
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic plasmid
      polynucleotide

<220>
<221> sig_peptide
<222> (1)..(60)

<220>
<221> CDS
<222> (1)..(396)

<220>
<221> mat_peptide
<222> (61)..(396)

<400> 43
atg agg ctc cct gct cag ctc ctg ggg ctg cta atg ctc tgg gtc cca
Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro
-20          -15          -10          -5

ggc tcc agt ggg gat gtt gtg atg act cag tct cca ctc tcc ctg ccc
Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro
      -1  1          5          10

gtc acc ctt gga cag ccg gcc tcc atc tcc tgc aga tca agt cag agc
Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser
      15          20          25

ctt gtg cac agt aat gga aag acc tat tta cat tgg ttt cag cag agg
Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Phe Gln Gln Arg
      30          35          40

cca ggc caa tct cca agg cgc cta att tat aaa gtt tcc aac cga ttt
Pro Gly Gln Ser Pro Arg Arg Leu Ile Tyr Lys Val Ser Asn Arg Phe
45          50          55          60

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tct ggt gtc cca gac aga ttc agc ggc agt ggg tca ggc act gat ttc	288
Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe	
65 70 75	
aca ctg aaa atc agc agg gtg gag gct gag gat gtt gga gtt tat ttc	336
Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Phe	
80 85 90	
tgc tct caa agt aca cat gtt ccg tac acg ttt ggc cag ggg acc aag	384
Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys	
95 100 105	
ctg gag atc aaa cgtgagtgga tccgcg	412
Leu Glu Ile Lys	
110	

<210> 44  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 44	
aagacctatt tacattggta ccagcagagg ccaggccaa	39

<210> 45  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 45	
ccaatgtaaa taggtcttttc	20

<210> 46  
 <211> 412  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid polynucleotide

<220>  
 <221> sig\_peptide  
 <222> (1)..(60)

<220>  
 <221> CDS  
 <222> (1)..(396)

<220>  
 <221> mat\_peptide

<222> (61)..(396)

<400> 46

atg	agg	ctc	cct	gct	cag	ctc	ctg	ggg	ctg	cta	atg	ctc	tgg	gtc	cca	48
Met	Arg	Leu	Pro	Ala	Gln	Leu	Leu	Gly	Leu	Leu	Met	Leu	Trp	Val	Pro	
-20					-15					-10					-5	

ggc	tcc	agt	ggg	gat	gtt	gtg	atg	act	cag	tct	cca	ctc	tcc	ctg	ccc	96
Gly	Ser	Ser	Gly	Asp	Val	Val	Met	Thr	Gln	Ser	Pro	Leu	Ser	Leu	Pro	
			-1	1				5					10			

gtc	acc	ctt	gga	cag	ccg	gcc	tcc	atc	tcc	tgc	aga	tca	agt	cag	agc	144
Val	Thr	Leu	Gly	Gln	Pro	Ala	Ser	Ile	Ser	Cys	Arg	Ser	Ser	Gln	Ser	
		15					20					25				

ctt	gtg	cac	agt	aat	gga	aag	acc	tat	tta	cat	tgg	tac	cag	cag	agg	192
Leu	Val	His	Ser	Asn	Gly	Lys	Thr	Tyr	Leu	His	Trp	Tyr	Gln	Gln	Arg	
	30					35					40					

cca	ggc	caa	tct	cca	agg	cgc	cta	att	tat	aaa	gtt	tcc	aac	cga	ttt	240
Pro	Gly	Gln	Ser	Pro	Arg	Arg	Leu	Ile	Tyr	Lys	Val	Ser	Asn	Arg	Phe	
45					50					55					60	

tct	ggt	gtc	cca	gac	aga	ttc	agc	ggc	agt	ggg	tca	ggc	act	gat	ttc	288
Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	
				65				70						75		

aca	ctg	aaa	atc	agc	agg	gtg	gag	gct	gag	gat	gtt	gga	gtt	tat	tac	336
Thr	Leu	Lys	Ile	Ser	Arg	Val	Glu	Ala	Glu	Asp	Val	Gly	Val	Tyr	Tyr	
			80					85					90			

tgc	tct	caa	agt	aca	cat	gtt	ccg	tac	acg	ttt	ggc	cag	ggg	acc	aag	384
Cys	Ser	Gln	Ser	Thr	His	Val	Pro	Tyr	Thr	Phe	Gly	Gln	Gly	Thr	Lys	
		95					100					105				

ctg	gag	atc	aaa	cg	tgag	tgga	tcc	gcg								412
Leu	Glu	Ile	Lys													
			110													

<210> 47

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 47

cctatttaca	ttggtttctg	cagaggccag	gccaatctc	39
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<210> 48

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 48

gaaaccaatg taaataggtc

20

<210> 49  
 <211> 412  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid polynucleotide

<220>  
 <221> sig\_peptide  
 <222> (1)..(60)

<220>  
 <221> CDS  
 <222> (1)..(396)

<220>  
 <221> mat\_peptide  
 <222> (61)..(396)

<400> 49  
 atg agg ctc cct gct cag ctc ctg ggg ctg cta atg ctc tgg gtc cca 48  
 Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Met Leu Trp Val Pro  
 -20 -15 -10 -5  
 ggc tcc agt ggg gat gtt gtg atg act cag tct cca ctc tcc ctg ccc 96  
 Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
 -1 1 5 10  
 gtc acc ctt gga cag ccg gcc tcc atc tcc tgc aga tca agt cag agc 144  
 Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
 15 20 25  
 ctt gtg cac agt aat gga aag acc tat tta cat tgg ttt ctg cag agg 192  
 Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Phe Leu Gln Arg  
 30 35 40  
 cca ggc caa tct cca agg cgc cta att tat aaa gtt tcc aac cga ttt 240  
 Pro Gly Gln Ser Pro Arg Arg Leu Ile Tyr Lys Val Ser Asn Arg Phe  
 45 50 55 60  
 tct ggt gtc cca gac aga ttc agc ggc agt ggg tca ggc act gat ttc 288  
 Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
 65 70 75  
 aca ctg aaa atc agc agg gtg gag gct gag gat gtt gga gtt tat tac 336  
 Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr  
 80 85 90  
 tgc tct caa agt aca cat gtt ccg tac acg ttt ggc cag ggg acc aag 384  
 Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys  
 95 100 105  
 ctg gag atc aaa cgtgagtgga tccgcg 412  
 Leu Glu Ile Lys  
 110

<210> 50  
 <211> 40  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide  
  
 <400> 50  
 cagaagccag gccagtctcc aagactcctg atctacaaag 40  
  
  
 <210> 51  
 <211> 40  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide  
  
 <400> 51  
 ggagactggc ctggcttctg cagataccaa tgtaaatagg 40  
  
  
 <210> 52  
 <211> 412  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
 polynucleotide  
  
  
 <220>  
 <221> sig\_peptide  
 <222> (1)..(60)  
  
 <220>  
 <221> CDS  
 <222> (1)..(396)  
  
 <220>  
 <221> mat\_peptide  
 <222> (61)..(396)  
  
 <400> 52  
 atg agg ctc cct gct cag ctc ctg ggg ctg cta atg ctc tgg gtc cca 48  
 Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
 -20 -15 -10 -5  
  
 ggc tcc agt ggg gat gtt gtg atg act cag tct cca ctc tcc ctg ccc 96  
 Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
 -1 1 5 10  
  
 gtc acc ctt gga cag ccg gcc tcc atc tcc tgc aga tca agt cag agc 144  
 Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
 15 20 25

ctt	gtg	cac	agt	aat	gga	aag	acc	tat	tta	cat	tgg	tat	ctg	cag	aag	192
Leu	Val	His	Ser	Asn	Gly	Lys	Thr	Tyr	Leu	His	Trp	Tyr	Leu	Gln	Lys	
30						35					40					

cca	ggc	cag	tct	cca	aga	ctc	ctg	atc	tac	aaa	ggt	tcc	aac	cga	ttt	240
Pro	Gly	Gln	Ser	Pro	Arg	Leu	Leu	Ile	Tyr	Lys	Val	Ser	Asn	Arg	Phe	
45					50					55					60	

tct	ggt	gtc	cca	gac	aga	ttc	agc	ggc	agt	ggg	tca	ggc	act	gat	ttc	288
Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	
				65				70						75		

aca	ctg	aaa	atc	agc	agg	gtg	gag	gct	gag	gat	ggt	gga	ggt	tat	tac	336
Thr	Leu	Lys	Ile	Ser	Arg	Val	Glu	Ala	Glu	Asp	Val	Gly	Val	Tyr	Tyr	
		80						85					90			

tgc	tct	caa	agt	aca	cat	gtt	ccg	tac	acg	ttt	ggc	cag	ggg	acc	aag	384
Cys	Ser	Gln	Ser	Thr	His	Val	Pro	Tyr	Thr	Phe	Gly	Gln	Gly	Thr	Lys	
		95					100					105				

ctg	gag	atc	aaa	cgtgagtgga	tccgcg	412
Leu	Glu	Ile	Lys			
110						

<210> 53  
 <211> 54  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 53	
cagtcctccac tctccctgcc cgtcaccctt ggagagccgg cctccatctc ctgc	54

<210> 54  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 54	
gggtggaggc tgatgatggt ggaatttatt actgctctc	39

<210> 55  
 <211> 48  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 55	
cagggagagt ggagactgag tcatcacaat atccccactg gagcctgg	48

<210> 56  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 56  
 ccaacatcat cagcctccac cc 22

<210> 57  
 <211> 412  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
 polynucleotide

<220>  
 <221> sig\_peptide  
 <222> (1)..(60)

<220>  
 <221> CDS  
 <222> (1)..(396)

<220>  
 <221> mat\_peptide  
 <222> (61)..(396)

<400> 57  
 atg agg ctc cct gct cag ctc ctg ggg ctg cta atg ctc tgg gtc cca 48  
 Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
 -20 -15 -10 -5

ggc tcc agt ggg gat att gtg atg act cag tct cca ctc tcc ctg ccc 96  
 Gly Ser Ser Gly Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
 -1 1 5 10

gtc acc cct gga gag ccg gcc tcc atc tcc tgc aga tca agt cag agc 144  
 Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
 15 20 25

ctt gtg cac agt aat gga aag acc tat tta cat tgg tat ctg cag aag 192  
 Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Tyr Leu Gln Lys  
 30 35 40

cca ggc cag tct cca aga ctc ctg atc tac aaa gtt tcc aac cga ttt 240  
 Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe  
 45 50 55 60

tct ggt gtc cca gac aga ttc agc ggc agt ggg tca ggc act gat ttc 288  
 Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
 65 70 75

aca ctg aaa atc agc agg gtg gag gct gat gat gtt gga att tat tac 336  
 Thr Leu Lys Ile Ser Arg Val Glu Ala Asp Asp Val Gly Ile Tyr Tyr

80	85	90	
tgc tct caa agt aca cat gtt ccg tac acg ttt ggc cag	ggg acc aag	384	
Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln	Gly Thr Lys		
95	100 105		
ctg gag atc aaa cgtgagtgga tccgcg		412	
Leu Glu Ile Lys			
110			
<210> 58			
<211> 38			
<212> DNA			
<213> Artificial Sequence			
<220>			
<223> Description of Artificial Sequence: Synthetic oligonucleotide			
<400> 58			
ccttcaccaa ccatgttatg cactggctgc gacaggcc		38	
<210> 59			
<211> 38			
<212> DNA			
<213> Artificial Sequence			
<220>			
<223> Description of Artificial Sequence: Synthetic oligonucleotide			
<400> 59			
ataatgagaa gttcaagggc agagtcacga tgacctca		38	
<210> 60			
<211> 38			
<212> DNA			
<213> Artificial Sequence			
<220>			
<223> Description of Artificial Sequence: Synthetic oligonucleotide			
<400> 60			
tgctagaggg gggttactatt cttacgacga ctggggcc		38	
<210> 61			
<211> 20			
<212> DNA			
<213> Artificial Sequence			
<220>			
<223> Description of Artificial Sequence: Synthetic oligonucleotide			
<400> 61			
ataacatggt tggatgaaggt		20	
<210> 62			
<211> 20			



<212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide  
  
 <400> 62  
 ccttgaactt ctcattatac 20  
  
  
 <210> 63  
 <211> 19  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide  
  
 <400> 63  
 atagtaaccc cctctagca 19  
  
  
 <210> 64  
 <211> 424  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
 polynucleotide  
  
  
 <220>  
 <221> sig\_peptide  
 <222> (1)..(57)  
  
 <220>  
 <221> CDS  
 <222> (1)..(408)  
  
 <220>  
 <221> mat\_peptide  
 <222> (58)..(408)  
  
 <400> 64  
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 Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
 -15 -10 -5  
  
 gtc cac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag 96  
 Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
 -1 1 5 10  
  
 cct ggg gcc tca gtg cag gtt tcc tgt aag gca tct gga tac acc ttc 144  
 Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
 15 20 25  
  
 acc aac cat gtt atg cac tgg ctg cga cag gcc cct gga caa ggg ctt 192  
 Thr Asn His Val Met His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu  
 30 35 40 45

gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat	240
Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn	
50 55 60	

gag aag ttc aag ggc aga gtc acg atg acc tca gac acg tcc atc agc	288
Glu Lys Phe Lys Gly Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser	
65 70 75	

aca gcc tac atg gag ttg agc agt ctc aga tct gac gac acg gcc gtc	336
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val	
80 85 90	

tat tat tgt gct aga ggg ggt tac tat tct tac gac gac tgg ggc caa	384
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Ser Tyr Asp Asp Trp Gly Gln	
95 100 105	

gca acc ctg gtc acc gtc tcc tca ggtgagtgga tccgcg	424
Ala Thr Leu Val Thr Val Ser Ser	
110 115	

<210> 65  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 65	
acagtaaggg aaacacctat ttacagtggg atctgcaga	39

<210> 66  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 66	
ataggtgttt cccttactgt gcagaaggct ctgacttga	39

<210> 67  
 <211> 412  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid polynucleotide

<220>  
 <221> sig\_peptide  
 <222> (1)..(60)

<220>  
 <221> CDS

<222> (1)..(396)

<220>

<221> mat\_peptide

<222> (61)..(396)

<400> 67

atg	agg	ctc	cct	gct	cag	ctc	ctg	ggg	ctg	cta	atg	ctc	tgg	gtc	cca	48
Met	Arg	Leu	Pro	Ala	Gln	Leu	Leu	Gly	Leu	Leu	Met	Leu	Trp	Val	Pro	
-20				-15				-10						-5		

ggc	tcc	agt	ggg	gat	att	gtg	atg	act	cag	tct	cca	ctc	tcc	ctg	ccc	96
Gly	Ser	Ser	Gly	Asp	Ile	Val	Met	Thr	Gln	Ser	Pro	Leu	Ser	Leu	Pro	
			-1	1				5					10			

gtc	acc	cct	gga	gag	ccg	gcc	tcc	atc	tcc	tgc	aga	tca	agt	cag	agc	144
Val	Thr	Pro	Gly	Glu	Pro	Ala	Ser	Ile	Ser	Cys	Arg	Ser	Ser	Gln	Ser	
		15					20					25				

ctt	ctg	cac	agt	aag	gga	aac	acc	tat	tta	cag	tgg	tat	ctg	cag	aag	192
Leu	Leu	His	Ser	Lys	Gly	Asn	Thr	Tyr	Leu	Gln	Trp	Tyr	Leu	Gln	Lys	
	30					35					40					

cca	ggc	cag	tct	cca	aga	ctc	ctg	atc	tac	aaa	ggt	tcc	aac	cga	ttt	240
Pro	Gly	Gln	Ser	Pro	Arg	Leu	Leu	Ile	Tyr	Lys	Val	Ser	Asn	Arg	Phe	
45					50				55						60	

tct	ggt	gtc	cca	gac	aga	ttc	agc	ggc	agt	ggg	tca	ggc	act	gat	ttc	288
Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	
				65				70						75		

aca	ctg	aaa	atc	agc	agg	gtg	gag	gct	gat	gat	ggt	gga	att	tat	tac	336
Thr	Leu	Lys	Ile	Ser	Arg	Val	Glu	Ala	Asp	Asp	Val	Gly	Ile	Tyr	Tyr	
		80						85					90			

tgc	tct	caa	agt	aca	cat	ggt	ccg	tac	acg	ttt	ggc	cag	ggg	acc	aag	384
Cys	Ser	Gln	Ser	Thr	His	Val	Pro	Tyr	Thr	Phe	Gly	Gln	Gly	Thr	Lys	
		95					100					105				

ctg	gag	atc	aaa	cgtgagtgga	tccgcg	412
Leu	Glu	Ile	Lys			
		110				

<210> 68

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 68

aggtgtcgac	tcccaggtgc	agctg	25
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<210> 69

<211> 35

<212> DNA

<213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic primer  
  
 <400> 69  
 ccaccactcg agactgtgac cagggttgct tggcc 35  
  
 <210> 70  
 <211> 44  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic primer  
  
 <400> 70  
 cagtctcgag tggtagcgga gggtccgata ttgtgatgac tcag 44  
  
 <210> 71  
 <211> 46  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic primer  
  
 <400> 71  
 aaaaggaaaa gcggccgctc attatttgat ctccagcttg gtcccc 46  
  
 <210> 72  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic oligonucleotide  
  
 <220>  
 <221> CDS  
 <222> (1)..(15)  
  
 <400> 72  
 ggt ggc gga ggt tcc 15  
 Gly Gly Gly Gly Ser  
 1 5  
  
 <210> 73  
 <211> 768  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
 polynucleotide  
  
 <220>

<221> sig\_peptide

<222> (1)..(57)

<220>

<221> CDS

<222> (1)..(759)

<220>

<221> mat\_peptide

<222> (58)..(759)

<400> 73

atg gga tgg agc tgt atc atc ctc ttc ttg gta gca aca gct aca ggt	48
Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly	
-15 -10 -5	

gtc gac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag	96
Val Asp Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys	
-1 1 5 10	

cct ggg gcc tca gtg cag gtt tcc tgt aag gca tct gga tac acc ttc	144
Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe	
15 20 25	

acc aac cat gtt att cac tgg ctg cga cag gcc cct gga caa ggg ctt	192
Thr Asn His Val Ile His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu	
30 35 40 45	

gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat	240
Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn	
50 55 60	

gag aag ttc aag gac aga gtc acg atg acc tca gac acg tcc atc agc	288
Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser	
65 70 75	

aca gcc tac atg gag ttg agc agt ctc aga tct gac gac acg gcc gtc	336
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val	
80 85 90	

tat tat tgt gct aga ggg ggt tac tat act tac gac gac tgg ggc caa	384
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln	
95 100 105	

gca acc ctg gtc aca gtc tcg agt ggt ggc gga ggt tcc gat att gtg	432
Ala Thr Leu Val Thr Val Ser Ser Gly Gly Gly Ser Asp Ile Val	
110 115 120 125	

atg act cag tct cca ctc tcc ctg ccc gtc acc cct gga gag ccg gcc	480
Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala	
130 135 140	

tcc atc tcc tgc aga tca agt cag agc ctt gtg cac agt aat gga aag	528
Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His Ser Asn Gly Lys	
145 150 155	

acc tat tta cat tgg tat ctg cag aag cca ggc cag tct cca aga ctc	576
Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Arg Leu	
160 165 170	

ctg atc tac aaa gtt tcc aac cga ttt tct ggt gtc cca gac aga ttc	624
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Leu	Ile	Tyr	Lys	Val	Ser	Asn	Arg	Phe	Ser	Gly	Val	Pro	Asp	Arg	Phe		
175						180					185						
agc	ggc	agt	ggg	tca	ggc	act	gat	ttc	aca	ctg	aaa	atc	agc	agg	gtg	672	
Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Lys	Ile	Ser	Arg	Val		
190					195					200					205		
gag	gct	gat	gat	gtt	gga	att	tat	tac	tgc	tct	caa	agt	aca	cat	gtt	720	
Glu	Ala	Asp	Asp	Val	Gly	Ile	Tyr	Tyr	Cys	Ser	Gln	Ser	Thr	His	Val		
				210					215						220		
ccg	tac	acg	ttt	ggc	cag	ggg	acc	aag	ctg	gag	atc	aaa	taatgagcg			768	
Pro	Tyr	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Leu	Glu	Ile	Lys					
			225					230									

<210> 74

<211> 768

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid polynucleotide

<220>

<221> sig\_peptide

<222> (1)..(57)

<220>

<221> CDS

<222> (1)..(759)

<220>

<221> mat\_peptide

<222> (58)..(759)

<400> 74

atg	gga	tgg	agc	tgt	atc	atc	ctc	ttc	ttg	gta	gca	aca	gct	aca	ggc	48	
Met	Gly	Trp	Ser	Cys	Ile	Ile	Leu	Phe	Leu	Val	Ala	Thr	Ala	Thr	Gly		
				-15					-10					-5			

gtc	gac	tcc	cag	gtg	cag	ctg	gtg	cag	tct	ggg	gct	gag	gtg	aag	aag	96	
Val	Asp	Ser	Gln	Val	Gln	Leu	Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys		
	-1	1				5						10					

cct	ggg	gcc	tca	gtg	cag	gtt	tcc	tgt	aag	gca	tct	gga	tac	acc	ttc	144	
Pro	Gly	Ala	Ser	Val	Gln	Val	Ser	Cys	Lys	Ala	Ser	Gly	Tyr	Thr	Phe		
	15					20					25						

acc	aac	cat	gtt	atg	cac	tgg	ctg	cga	cag	gcc	cct	gga	caa	ggg	ctt	192	
Thr	Asn	His	Val	Met	His	Trp	Leu	Arg	Gln	Ala	Pro	Gly	Gln	Gly	Leu		
30					35				40						45		

gag	tgg	atg	gga	tat	att	tat	cct	tac	aat	gat	ggc	act	aag	tat	aat	240	
Glu	Trp	Met	Gly	Tyr	Ile	Tyr	Pro	Tyr	Asn	Asp	Gly	Thr	Lys	Tyr	Asn		
			50					55						60			

gag	aag	ttc	aag	ggc	aga	gtc	acg	atg	acc	tca	gac	acg	tcc	atc	agc	288	
Glu	Lys	Phe	Lys	Gly	Arg	Val	Thr	Met	Thr	Ser	Asp	Thr	Ser	Ile	Ser		

65	70	75	
aca gcc tac atg gag ttg agc agt ctc aga tct gac gac acg gcc gtc			336
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val			
80	85	90	
tat tat tgt gct aga ggg ggt tac tat tct tac gac gac tgg ggc caa			384
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Ser Tyr Asp Asp Trp Gly Gln			
95	100	105	
gca acc ctg gtc aca gtc tcg agt ggt ggc gga ggt tcc gat att gtg			432
Ala Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Asp Ile Val			
110	115	120	125
atg act cag tct cca ctc tcc ctg ccc gtc acc cct gga gag ccg gcc			480
Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala			
	130	135	140
tcc atc tcc tgc aga tca agt cag agc ctt ctg cac agt aag gga aac			528
Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser Lys Gly Asn			
	145	150	155
acc tat tta cag tgg tat ctg cag aag cca ggc cag tct cca aga ctc			576
Thr Tyr Leu Gln Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Arg Leu			
	160	165	170
ctg atc tac aaa gtt tcc aac cga ttt tct ggt gtc cca gac aga ttc			624
Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe			
	175	180	185
agc ggc agt ggg tca ggc act gat ttc aca ctg aaa atc agc agg gtg			672
Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val			
190	195	200	205
gag gct gat gat gtt gga att tat tac tgc tct caa agt aca cat gtt			720
Glu Ala Asp Asp Val Gly Ile Tyr Tyr Cys Ser Gln Ser Thr His Val			
	210	215	220
ccg tac acg ttt ggc cag ggg acc aag ctg gag atc aaa taatgagcg			768
Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys			
	225	230	

<210> 75

<211> 44

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 75

cgcggatccg gtggtggcgg atcgaggtg cagctggtgc agtc

44

<210> 76

<211> 54

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 76  
cgcggatcca ccaccacccg aaccaccacc acctttgatc tccagcttgg tccc 54

<210> 77  
<211> 45  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<220>  
<221> CDS  
<222> (1)..(45)

<400> 77  
ggt ggt ggt ggt tcg ggt ggt ggt gga tcc ggt ggt ggc gga tcg 45  
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser  
1 5 10 15

<210> 78  
<211> 1515  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic plasmid  
polynucleotide

<220>  
<221> sig\_peptide  
<222> (1)..(57)

<220>  
<221> CDS  
<222> (1)..(1506)

<220>  
<221> mat\_peptide  
<222> (58)..(1506)

<400> 78  
atg gga tgg agc tgt atc atc ctc ttc ttg gta gca aca gct aca ggt 48  
Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly  
-15 -10 -5

gtc gac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag 96  
Val Asp Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
-1 1 5 10

cct ggg gcc tca gtg cag gtt tcc tgt aag gca tct gga tac acc ttc 144  
Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
15 20 25

acc aac cat gtt att cac tgg ctg cga cag gcc cct gga caa ggg ctt 192



Thr	Asn	His	Val	Ile	His	Trp	Leu	Arg	Gln	Ala	Pro	Gly	Gln	Gly	Leu	
30					35					40					45	
gag	tgg	atg	gga	tat	att	tat	cct	tac	aat	gat	ggg	act	aag	tat	aat	240
Glu	Trp	Met	Gly	Tyr	Ile	Tyr	Pro	Tyr	Asn	Asp	Gly	Thr	Lys	Tyr	Asn	
				50					55					60		
gag	aag	ttc	aag	gac	aga	gtc	acg	atg	acc	tca	gac	acg	tcc	atc	agc	288
Glu	Lys	Phe	Lys	Asp	Arg	Val	Thr	Met	Thr	Ser	Asp	Thr	Ser	Ile	Ser	
			65					70					75			
aca	gcc	tac	atg	gag	ttg	agc	agt	ctc	aga	tct	gac	gac	acg	gcc	gtc	336
Thr	Ala	Tyr	Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Asp	Asp	Thr	Ala	Val	
		80					85					90				
tat	tat	tgt	gct	aga	ggg	ggg	tac	tat	act	tac	gac	gac	tgg	ggc	caa	384
Tyr	Tyr	Cys	Ala	Arg	Gly	Gly	Tyr	Tyr	Thr	Tyr	Asp	Asp	Trp	Gly	Gln	
	95					100					105					
gca	acc	ctg	gtc	aca	gtc	tcg	agt	ggg	ggc	gga	ggg	tcc	gat	att	gtg	432
Ala	Thr	Leu	Val	Thr	Val	Ser	Ser	Gly	Gly	Gly	Gly	Ser	Asp	Ile	Val	
110					115				120					125		
atg	act	cag	tct	cca	ctc	tcc	ctg	ccc	gtc	acc	cct	gga	gag	ccg	gcc	480
Met	Thr	Gln	Ser	Pro	Leu	Ser	Leu	Pro	Val	Thr	Pro	Gly	Glu	Pro	Ala	
				130				135						140		
tcc	atc	tcc	tgc	aga	tca	agt	cag	agc	ctt	gtg	cac	agt	aat	gga	aag	528
Ser	Ile	Ser	Cys	Arg	Ser	Ser	Gln	Ser	Leu	Val	His	Ser	Asn	Gly	Lys	
			145				150						155			
acc	tat	tta	cat	tgg	tat	ctg	cag	aag	cca	ggc	cag	tct	cca	aga	ctc	576
Thr	Tyr	Leu	His	Trp	Tyr	Leu	Gln	Lys	Pro	Gly	Gln	Ser	Pro	Arg	Leu	
		160				165						170				
ctg	atc	tac	aaa	gtt	tcc	aac	cga	ttt	tct	ggg	gtc	cca	gac	aga	ttc	624
Leu	Ile	Tyr	Lys	Val	Ser	Asn	Arg	Phe	Ser	Gly	Val	Pro	Asp	Arg	Phe	
	175					180					185					
agc	ggc	agt	ggg	tca	ggc	act	gat	ttc	aca	ctg	aaa	atc	agc	agg	gtg	672
Ser	Gly	Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Lys	Ile	Ser	Arg	Val	
190					195				200					205		
gag	gct	gat	gat	gtt	gga	att	tat	tac	tgc	tct	caa	agt	aca	cat	gtt	720
Glu	Ala	Asp	Asp	Val	Gly	Ile	Tyr	Tyr	Cys	Ser	Gln	Ser	Thr	His	Val	
				210				215						220		
ccg	tac	acg	ttt	ggc	cag	ggg	acc	aag	ctg	gag	atc	aaa	ggg	ggg	ggg	768
Pro	Tyr	Thr	Phe	Gly	Gln	Gly	Thr	Lys	Leu	Glu	Ile	Lys	Gly	Gly	Gly	
			225					230					235			
ggg	tcg	ggg	ggg	ggg	gga	tcc	ggg	ggg	ggc	gga	tcg	cag	gtg	cag	ctg	816
Gly	Ser	Gly	Gly	Gly	Gly	Ser	Gly	Gly	Gly	Gly	Ser	Gln	Val	Gln	Leu	
		240					245					250				
gtg	cag	tct	ggg	gct	gag	gtg	aag	aag	cct	ggg	gcc	tca	gtg	cag	gtt	864
Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys	Pro	Gly	Ala	Ser	Val	Gln	Val	
		255				260					265					
tcc	tgt	aag	gca	tct	gga	tac	acc	ttc	acc	aac	cat	gtt	att	cac	tgg	912
Ser	Cys	Lys	Ala	Ser	Gly	Tyr	Thr	Phe	Thr	Asn	His	Val	Ile	His	Trp	

270	275	280	285	
ctg cga cag gcc cct gga caa ggg ctt gag tgg atg gga tat att tat				960
Leu Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met Gly Tyr Ile Tyr				
	290	295	300	
cct tac aat gat ggt act aag tat aat gag aag ttc aag gac aga gtc				1008
Pro Tyr Asn Asp Gly Thr Lys Tyr Asn Glu Lys Phe Lys Asp Arg Val				
	305	310	315	
acg atg acc tca gac acg tcc atc agc aca gcc tac atg gag ttg agc				1056
Thr Met Thr Ser Asp Thr Ser Ile Ser Thr Ala Tyr Met Glu Leu Ser				
	320	325	330	
agt ctc aga tct gac gac acg gcc gtc tat tat tgt gct aga ggg ggt				1104
Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys Ala Arg Gly Gly				
	335	340	345	
tac tat act tac gac gac tgg ggc caa gca acc ctg gtc aca gtc tcg				1152
Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln Ala Thr Leu Val Thr Val Ser				
	350	355	360	365
agt ggt ggc gga ggt tcc gat att gtg atg act cag tct cca ctc tcc				1200
Ser Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln Ser Pro Leu Ser				
	370	375	380	
ctg ccc gtc acc cct gga gag ccg gcc tcc atc tcc tgc aga tca agt				1248
Leu Pro Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser				
	385	390	395	
cag agc ctt gtg cac agt aat gga aag acc tat tta cat tgg tat ctg				1296
Gln Ser Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Tyr Leu				
	400	405	410	
cag aag cca ggc cag tct cca aga ctc ctg atc tac aaa gtt tcc aac				1344
Gln Lys Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn				
	415	420	425	
cga ttt tct ggt gtc cca gac aga ttc agc ggc agt ggg tca ggc act				1392
Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr				
	430	435	440	445
gat ttc aca ctg aaa atc agc agg gtg gag gct gat gat gtt gga att				1440
Asp Phe Thr Leu Lys Ile Ser Arg Val Glu Ala Asp Asp Val Gly Ile				
	450	455	460	
tat tac tgc tct caa agt aca cat gtt ccg tac acg ttt ggc cag ggg				1488
Tyr Tyr Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly				
	465	470	475	
acc aag ctg gag atc aaa taatgagcg				1515
Thr Lys Leu Glu Ile Lys				
	480			

<210> 79

<211> 1515

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid polynucleotide

<220>

<221> sig\_peptide

<222> (1)..(57)

<220>

<221> CDS

<222> (1)..(1506)

<220>

<221> mat\_peptide

<222> (58)..(1506)

<400> 79

atg gga tgg agc tgt atc atc ctc ttc ttg gta gca aca gct aca ggt	48
Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly	
-15 -10 -5	

gtc gac tcc cag gtg cag ctg gtg cag tct ggg gct gag gtg aag aag	96
Val Asp Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys	
-1 1 5 10	

cct ggg gcc tca gtg cag gtt tcc tgt aag gca tct gga tac acc ttc	144
Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe	
15 20 25	

acc aac cat gtt atg cac tgg ctg cga cag gcc cct gga caa ggg ctt	192
Thr Asn His Val Met His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu	
30 35 40 45	

gag tgg atg gga tat att tat cct tac aat gat ggt act aag tat aat	240
Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn	
50 55 60	

gag aag ttc aag ggc aga gtc acg atg acc tca gac acg tcc atc agc	288
Glu Lys Phe Lys Gly Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser	
65 70 75	

aca gcc tac atg gag ttg agc agt ctc aga tct gac gac acg gcc gtc	336
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val	
80 85 90	

tat tat tgt gct aga ggg ggt tac tat tct tac gac gac tgg ggc caa	384
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Ser Tyr Asp Asp Trp Gly Gln	
95 100 105	

gca acc ctg gtc aca gtc tcg agt ggt ggc gga ggt tcc gat att gtg	432
Ala Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Asp Ile Val	
110 115 120 125	

atg act cag tct cca ctc tcc ctg ccc gtc acc cct gga gag ccg gcc	480
Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala	
130 135 140	

tcc atc tcc tgc aga tca agt cag agc ctt ctg cac agt aag gga aac	528
Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser Lys Gly Asn	
145 150 155	

acc tat tta cag tgg tat ctg cag aag cca ggc cag tct cca aga ctc	576
Thr Tyr Leu Gln Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Arg Leu	
160 165 170	
ctg atc tac aaa gtt tcc aac cga ttt tct ggt gtc cca gac aga ttc	624
Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe	
175 180 185	
agc ggc agt ggg tca ggc act gat ttc aca ctg aaa atc agc agg gtg	672
Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val	
190 195 200 205	
gag gct gat gat gtt gga att tat tac tgc tct caa agt aca cat gtt	720
Glu Ala Asp Asp Val Gly Ile Tyr Tyr Cys Ser Gln Ser Thr His Val	
210 215 220	
ccg tac acg ttt ggc cag ggg acc aag ctg gag atc aaa ggt ggt ggt	768
Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Gly Gly Gly	
225 230 235	
ggt tgc ggt ggt ggt gga tcc ggt ggt ggc gga tgc cag gtg cag ctg	816
Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu	
240 245 250	
gtg cag tct ggg gct gag gtg aag aag cct ggg gcc tca gtg cag gtt	864
Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala Ser Val Gln Val	
255 260 265	
tcc tgt aag gca tct gga tac acc ttc acc aac cat gtt atg cac tgg	912
Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn His Val Met His Trp	
270 275 280 285	
ctg cga cag gcc cct gga caa ggg ctt gag tgg atg gga tat att tat	960
Leu Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met Gly Tyr Ile Tyr	
290 295 300	
cct tac aat gat ggt act aag tat aat gag aag ttc aag ggc aga gtc	1008
Pro Tyr Asn Asp Gly Thr Lys Tyr Asn Glu Lys Phe Lys Gly Arg Val	
305 310 315	
acg atg acc tca gac acg tcc atc agc aca gcc tac atg gag ttg agc	1056
Thr Met Thr Ser Asp Thr Ser Ile Ser Thr Ala Tyr Met Glu Leu Ser	
320 325 330	
agt ctc aga tct gac gac acg gcc gtc tat tat tgt gct aga ggg ggt	1104
Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys Ala Arg Gly Gly	
335 340 345	
tac tat tct tac gac gac tgg ggc caa gca acc ctg gtc aca gtc tgc	1152
Tyr Tyr Ser Tyr Asp Asp Trp Gly Gln Ala Thr Leu Val Thr Val Ser	
350 355 360 365	
agt ggt ggc gga ggt tcc gat att gtg atg act cag tct cca ctc tcc	1200
Ser Gly Gly Gly Ser Asp Ile Val Met Thr Gln Ser Pro Leu Ser	
370 375 380	
ctg ccc gtc acc cct gga gag ccg gcc tcc atc tcc tgc aga tca agt	1248
Leu Pro Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser	
385 390 395	
cag agc ctt ctg cac agt aag gga aac acc tat tta cag tgg tat ctg	1296

Gln Ser Leu Leu His Ser Lys Gly Asn Thr Tyr Leu Gln Trp Tyr Leu	
400 405 410	
cag aag cca ggc cag tct cca aga ctc ctg atc tac aaa gtt tcc aac	1344
Gln Lys Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn	
415 420 425	
cga ttt tct ggt gtc cca gac aga ttc agc ggc agt ggg tca ggc act	1392
Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr	
430 435 440 445	
gat ttc aca ctg aaa atc agc agg gtg gag gct gat gat gtt gga att	1440
Asp Phe Thr Leu Lys Ile Ser Arg Val Glu Ala Asp Asp Val Gly Ile	
450 455 460	
tat tac tgc tct caa agt aca cat gtt ccg tac acg ttt ggc cag ggg	1488
Tyr Tyr Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly	
465 470 475	
acc aag ctg gag atc aaa taatgagcg	1515
Thr Lys Leu Glu Ile Lys	
480	

<210> 80  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 80	
ctcgaggaat tcccaccatg ggatggagct gtatcatcc	39

<210> 81  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 81	
gggggcctgt cgcagccagt gaataac	27

<210> 82  
 <211> 45  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 82	
gggcagtcag tgtatacggc cgtgtcgtca gatctgagac tgctc	45

<210> 83

<211> 35  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic primer  
  
 <400> 83  
 gggcaatgcc ttgagtggat gggatatatt tatcc 35

<210> 84  
 <211> 54  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic primer  
  
 <400> 84  
 tcattatttg atctcaagct tgggtccgca gccaaacgtg tacggaacat gtgt 54

<210> 85  
 <211> 68  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic primer  
  
 <400> 85  
 tactattgtg ctagagggggg ttactatact tacgacgact ggggctgcgc aaccctggtc 60  
 acagtctc 68

<210> 86  
 <211> 35  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic primer  
  
 <400> 86  
 gggcttctgc agataccaat gtaaataaggc ctttc 35

<210> 87  
 <211> 36  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic primer  
  
 <400> 87  
 gggcagtgcc caagactcct gatctacaaa gtttcc 36

<210> 88  
 <211> 37  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic primer

<400> 88  
 tcattatttg atctcaagct tggccccctg gccaaac 37

<210> 89  
 <211> 708  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 89  
 cagggtgcagc tgggtgcagtc tggggctgag gtgaagaagc ctggggcctc agtgcagggt 60  
 tcctgtaagg catctggata caccttcacc aaccatgtta ttcactggct gcgacaggcc 120  
 cccgggcaat gccttgagtg gatgggatat atttatcctt acaatgatgg tactaagtat 180  
 aatgagaagt tcaaggacag agtcacgatg acctcagaca cgtccatcag cacagcctac 240  
 atggagttga gcagtctcag atctgacgac acggccgtct attattgtgc tagaggggggt 300  
 tactatactt acgacgactg gggccaagca accctgggtca cagtctcgag tggtgggcga 360  
 gggtccgata ttgtgatgac tcagtctcca ctctccctgc ccgtcacccc tggagagccg 420  
 gcctccatct cctgcagatc aagtcagagc cttgtgcaca gtaatggaaa gacctattta 480  
 cattggatc tgcagaagcc aggccagtct ccaagactcc tgatctacaa agtttccaac 540  
 cgattttctg gtgtcccaga cagattcagc ggcagtgggt caggcactga tttcacactg 600  
 aaaatcagca ggggtggaggc tgatgatgtt ggaatttatt actgctctca aagtacacat 660  
 gttccgtaca cgtttggctg cgggaccaag cttgagatca aataatga 708

<210> 90  
 <211> 234  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic polypeptide

<400> 90  
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15  
 Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn His  
 20 25 30

Val Ile His Trp Leu Arg Gln Ala Pro Gly Gln Cys Leu Glu Trp Met  
35 40 45

Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn Glu Lys Phe  
50 55 60

Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser Thr Ala Tyr  
65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln Ala Thr Leu  
100 105 110

Val Thr Val Ser Ser Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln  
115 120 125

Ser Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala Ser Ile Ser  
130 135 140

Cys Arg Ser Ser Gln Ser Leu Val His Ser Asn Gly Lys Thr Tyr Leu  
145 150 155 160

His Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr  
165 170 175

Lys Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser  
180 185 190

Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val Glu Ala Asp  
195 200 205

Asp Val Gly Ile Tyr Tyr Cys Ser Gln Ser Thr His Val Pro Tyr Thr  
210 215 220

Phe Gly Cys Gly Thr Lys Leu Glu Ile Lys  
225 230

<210> 91

<211> 708

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic polynucleotide



<400> 91  
caggtgcagc tgggtgcagtc tgggggctgag gtgaagaagc ctggggcctc agtgcaggtt 60  
tcctgtaagg catctggata caccttcacc aaccatgtta ttcactggct gcgacaggcc 120  
cctgggcaag ggcttgagtg gatgggatat atttaccctt acaatgatgg tactaagtat 180  
aatgagaagt tcaaggacag agtcacgatg acctcagaca cgtccatcag cacagcctac 240  
atggagttga gcagtctcag atctgacgac acggccgtat actattgtgc tagagggggt 300  
tactatactt acgacgactg gggctgcgca accctgggtca cagtctcgag tgggtggcgga 360  
ggttccgata ttgtgatgac tcagtctcca ctctccctgc ccgtcacccc tggagagccg 420  
gcctccatct cctgcagatc aagtcagagc cttgtgcaca gtaatggaaa gacctattta 480  
cattgggtatc tgcagaagcc cgggcagtgc ccaagactcc tgatctacaa agtttccaac 540  
cgattttctg gtgtcccaga cagattcagc ggcagtgggt caggcactga tttcacactg 600  
aaaatcagca ggggtggaggc tgatgatggt ggaatttatt actgctctca aagtacacat 660  
gttccgtaca cgtttggcca ggggaccaag cttgagatca aataatga 708

<210> 92  
<211> 234  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 92  
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
1 5 10 15  
Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn His  
20 25 30  
Val Ile His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
35 40 45  
Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn Glu Lys Phe  
50 55 60  
Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser Thr Ala Tyr  
65 70 75 80  
Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
85 90 95  
Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Cys Ala Thr Leu

100	105	110
Val Thr Val Ser Ser Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln		
115	120	125
Ser Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala Ser Ile Ser		
130	135	140
Cys Arg Ser Ser Gln Ser Leu Val His Ser Asn Gly Lys Thr Tyr Leu		
145	150	155
His Trp Tyr Leu Gln Lys Pro Gly Gln Cys Pro Arg Leu Leu Ile Tyr		
165	170	175
Lys Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser		
180	185	190
Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val Glu Ala Asp		
195	200	205
Asp Val Gly Ile Tyr Tyr Cys Ser Gln Ser Thr His Val Pro Tyr Thr		
210	215	220
Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys		
225	230	
<210> 93		
<211> 136		
<212> PRT		
<213> Artificial Sequence		
<220>		
<223> Description of Artificial Sequence: Synthetic plasmid polypeptide		
<400> 93		
Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly		
-15	-10	-5
Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys		
-1 1	5	10
Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe		
15	20	25
Ala Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu		
30	35	40
		45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
50 55 60

Glu Lys Phe Lys Asp Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser  
65 70 75

Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val  
80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
95 100 105

Gly Thr Leu Val Thr Val Ser Ser  
110 115

<210> 94

<211> 136

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 94

Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
-15 -10 -5

Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
-1 1 5 10

Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
15 20 25

Ala Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu  
30 35 40 45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
50 55 60

Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Thr Ser  
65 70 75

Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val  
80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
95 100 105

Gly Thr Leu Val Thr Val Ser Ser  
110 115

<210> 95  
<211> 136  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 95  
Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
-15 -10 -5

Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
-1 1 5 10

Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
15 20 25

Thr Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu  
30 35 40 45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
50 55 60

Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Thr Ser  
65 70 75

Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val  
80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
95 100 105

Gly Thr Leu Val Thr Val Ser Ser  
110 115

<210> 96  
<211> 136  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 96

Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
                   -15                                  -10                                  -5

Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
           -1  1                                  5                                  10

Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
   15                                  20                                  25

Ala Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu  
  30                                  35                                  40                                  45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
                   50                                  55                                  60

Glu Lys Phe Lys Asp Lys Val Thr Met Thr Ser Asp Thr Ser Thr Ser  
                   65                                  70                                  75

Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val  
       80                                  85                                  90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
   95                                  100                                  105

Gly Thr Leu Val Thr Val Ser Ser  
  110                                  115

<210> 97

<211> 136

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
           polypeptide

<400> 97

Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
                   -15                                  -10                                  -5

Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
           -1  1                                  5                                  10

Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
   15                                  20                                  25

Ala Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu  
  30                                  35                                  40                                  45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
50 55 60

Glu Lys Phe Lys Asp Arg Val Thr Leu Thr Ser Asp Thr Ser Thr Ser  
65 70 75

Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val  
80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
95 100 105

Gly Thr Leu Val Thr Val Ser Ser  
110 115

<210> 98

<211> 136

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 98

Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
-15 -10 -5

Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
-1 1 5 10

Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
15 20 25

Thr Asn His Val Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu  
30 35 40 45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
50 55 60

Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Thr Ser  
65 70 75

Thr Val Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val  
80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
95 100 105

Gly Thr Leu Val Thr Val Ser Ser  
110 115

<210> 99  
<211> 136  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 99  
Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
-15 -10 -5

Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
-1 1 5 10

Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
15 20 25

Thr Asn His Val Ile His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu  
30 35 40 45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
50 55 60

Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser  
65 70 75

Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val  
80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
95 100 105

Ala Thr Leu Val Thr Val Ser Ser  
110 115

<210> 100  
<211> 132  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 100

Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
-20 -15 -10 -5

Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
-1 1 5 10

Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
15 20 25

Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Phe Gln Gln Arg  
30 35 40

Pro Gly Gln Ser Pro Arg Arg Leu Ile Tyr Lys Val Ser Asn Arg Phe  
45 50 55 60

Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
65 70 75

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr  
80 85 90

Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys  
95 100 105

Leu Glu Ile Lys  
110

<210> 101

<211> 132

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 101

Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
-20 -15 -10 -5

Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
-1 1 5 10

Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
15 20 25

Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Phe Gln Gln Arg  
30 35 40



Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe  
45 50 55 60

Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Thr Asp Phe  
65 70 75

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr  
80 85 90

Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys  
95 100 105

Leu Glu Ile Lys  
110

<210> 102

<211> 132

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 102

Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
-20 -15 -10 -5

Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
-1 1 5 10

Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
15 20 25

Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Phe Gln Gln Arg  
30 35 40

Pro Gly Gln Ser Pro Arg Arg Leu Ile Tyr Lys Val Ser Asn Arg Phe  
45 50 55 60

Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
65 70 75

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Phe  
80 85 90

Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys

95

100

105

Leu Glu Ile Lys  
110

<210> 103  
<211> 132  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 103

Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
-20 -15 -10 -5

Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
-1 1 5 10

Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
15 20 25

Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Tyr Gln Gln Arg  
30 35 40

Pro Gly Gln Ser Pro Arg Arg Leu Ile Tyr Lys Val Ser Asn Arg Phe  
45 50 55 60

Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
65 70 75

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr  
80 85 90

Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys  
95 100 105

Leu Glu Ile Lys  
110

<210> 104  
<211> 132  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 104

Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
-20 -15 -10 -5

Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
-1 1 5 10

Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
15 20 25

Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Phe Leu Gln Arg  
30 35 40

Pro Gly Gln Ser Pro Arg Arg Leu Ile Tyr Lys Val Ser Asn Arg Phe  
45 50 55 60

Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
65 70 75

Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr  
80 85 90

Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys  
95 100 105

Leu Glu Ile Lys  
110

<210> 105

<211> 132

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 105

Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
-20 -15 -10 -5

Gly Ser Ser Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
-1 1 5 10

Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
15 20 25

Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Tyr Leu Gln Lys

30                                      35                                      40  
 Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe  
 45                                      50                                      55                                      60  
 Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
                                     65                                      70                                      75  
 Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr  
                                     80                                      85                                      90  
 Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys  
                                     95                                      100                                      105  
 Leu Glu Ile Lys  
                                     110  
 <210> 106  
 <211> 132  
 <212> PRT  
 <213> Artificial Sequence  
 <220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
                                     polypeptide  
 <400> 106  
 Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
 -20                                      -15                                      -10                                      -5  
 Gly Ser Ser Gly Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
                                     -1    1                                      5                                      10  
 Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
                                     15                                      20                                      25  
 Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Tyr Leu Gln Lys  
                                     30                                      35                                      40  
 Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe  
 45                                      50                                      55                                      60  
 Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
                                     65                                      70                                      75  
 Thr Leu Lys Ile Ser Arg Val Glu Ala Asp Asp Val Gly Ile Tyr Tyr  
                                     80                                      85                                      90

Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys  
 95 100 105

Leu Glu Ile Lys  
 110

<210> 107  
 <211> 136  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
 polypeptide

<400> 107  
 Met Glu Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly  
 -15 -10 -5

Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
 -1 1 5 10

Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
 15 20 25

Thr Asn His Val Met His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu  
 30 35 40 45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
 50 55 60

Glu Lys Phe Lys Gly Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser  
 65 70 75

Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val  
 80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Ser Tyr Asp Asp Trp Gly Gln  
 95 100 105

Ala Thr Leu Val Thr Val Ser Ser  
 110 115

<210> 108  
 <211> 132  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid

polypeptide

<400> 108

Met Arg Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro  
-20 -15 -10 -5

Gly Ser Ser Gly Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro  
-1 1 5 10

Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser  
15 20 25

Leu Leu His Ser Lys Gly Asn Thr Tyr Leu Gln Trp Tyr Leu Gln Lys  
30 35 40

Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe  
45 50 55 60

Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
65 70 75

Thr Leu Lys Ile Ser Arg Val Glu Ala Asp Asp Val Gly Ile Tyr Tyr  
80 85 90

Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly Thr Lys  
95 100 105

Leu Glu Ile Lys  
110

<210> 109

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 109

Gly Gly Gly Gly Ser  
1 5

<210> 110

<211> 253

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
polypeptide

<400> 110

Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly  
-15 -10 -5

Val Asp Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
-1 1 5 10

Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
15 20 25

Thr Asn His Val Ile His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu  
30 35 40 45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
50 55 60

Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser  
65 70 75

Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val  
80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln  
95 100 105

Ala Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Asp Ile Val  
110 115 120 125

Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala  
130 135 140

Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His Ser Asn Gly Lys  
145 150 155

Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Arg Leu  
160 165 170

Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe  
175 180 185

Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val  
190 195 200 205

Glu Ala Asp Asp Val Gly Ile Tyr Tyr Cys Ser Gln Ser Thr His Val  
210 215 220

Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys  
 225 230

<210> 111  
 <211> 253  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid polypeptide

<400> 111  
 Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly  
 -15 -10 -5

Val Asp Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
 -1 1 5 10

Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
 15 20 25

Thr Asn His Val Met His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu  
 30 35 40 45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
 50 55 60

Glu Lys Phe Lys Gly Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser  
 65 70 75

Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val  
 80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Ser Tyr Asp Asp Trp Gly Gln  
 95 100 105

Ala Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Asp Ile Val  
 110 115 120 125

Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala  
 130 135 140

Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser Lys Gly Asn  
 145 150 155

Thr Tyr Leu Gln Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Arg Leu  
 160 165 170



Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe  
 175 180 185

Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val  
 190 195 200 205

Glu Ala Asp Asp Val Gly Ile Tyr Tyr Cys Ser Gln Ser Thr His Val  
 210 215 220

Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys  
 225 230

<210> 112  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 112  
 Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser  
 1 5 10 15

<210> 113  
 <211> 502  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic plasmid  
 polypeptide

<400> 113  
 Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly  
 -15 -10 -5

Val Asp Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys  
 -1 1 5 10

Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
 15 20 25

Thr Asn His Val Ile His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu  
 30 35 40 45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
 50 55 60

Glu Lys Phe Lys Asp Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser

65	70	75
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val		
80	85	90
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln		
95	100	105
Ala Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Asp Ile Val		
110	115	120
Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala		
130	135	140
Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His Ser Asn Gly Lys		
145	150	155
Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Arg Leu		
160	165	170
Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe		
175	180	185
Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val		
190	195	200
Glu Ala Asp Asp Val Gly Ile Tyr Tyr Cys Ser Gln Ser Thr His Val		
210	215	220
Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Gly Gly Gly		
225	230	235
Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu		
240	245	250
Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala Ser Val Gln Val		
255	260	265
Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn His Val Ile His Trp		
270	275	280
Leu Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met Gly Tyr Ile Tyr		
290	295	300
Pro Tyr Asn Asp Gly Thr Lys Tyr Asn Glu Lys Phe Lys Asp Arg Val		
305	310	315

Thr Met Thr Ser Asp Thr Ser Ile Ser Thr Ala Tyr Met Glu Leu Ser  
 320 325 330

Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys Ala Arg Gly Gly  
 335 340 345

Tyr Tyr Thr Tyr Asp Asp Trp Gly Gln Ala Thr Leu Val Thr Val Ser  
 350 355 360 365

Ser Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln Ser Pro Leu Ser  
 370 375 380

Leu Pro Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser  
 385 390 395

Gln Ser Leu Val His Ser Asn Gly Lys Thr Tyr Leu His Trp Tyr Leu  
 400 405 410

Gln Lys Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn  
 415 420 425

Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr  
 430 435 440 445

Asp Phe Thr Leu Lys Ile Ser Arg Val Glu Ala Asp Asp Val Gly Ile  
 450 455 460

Tyr Tyr Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly  
 465 470 475

Thr Lys Leu Glu Ile Lys  
 480

<210> 114

<211> 502

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic plasmid  
 polypeptide

<400> 114

Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ala Thr Ala Thr Gly  
 -15 -10 -5

Val Asp Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys

-1 1

5

10

Pro Gly Ala Ser Val Gln Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe  
15 20 25

Thr Asn His Val Met His Trp Leu Arg Gln Ala Pro Gly Gln Gly Leu  
30 35 40 45

Glu Trp Met Gly Tyr Ile Tyr Pro Tyr Asn Asp Gly Thr Lys Tyr Asn  
50 55 60

Glu Lys Phe Lys Gly Arg Val Thr Met Thr Ser Asp Thr Ser Ile Ser  
65 70 75

Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val  
80 85 90

Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Ser Tyr Asp Asp Trp Gly Gln  
95 100 105

Ala Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Asp Ile Val  
110 115 120 125

Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly Glu Pro Ala  
130 135 140

Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser Lys Gly Asn  
145 150 155

Thr Tyr Leu Gln Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Arg Leu  
160 165 170

Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe  
175 180 185

Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile Ser Arg Val  
190 195 200 205

Glu Ala Asp Asp Val Gly Ile Tyr Tyr Cys Ser Gln Ser Thr His Val  
210 215 220

Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Gly Gly Gly  
225 230 235

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val Gln Leu  
240 245 250

Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala Ser Val Gln Val  
 255 260 265

Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asn His Val Met His Trp  
 270 275 280 285

Leu Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met Gly Tyr Ile Tyr  
 290 295 300

Pro Tyr Asn Asp Gly Thr Lys Tyr Asn Glu Lys Phe Lys Gly Arg Val  
 305 310 315

Thr Met Thr Ser Asp Thr Ser Ile Ser Thr Ala Tyr Met Glu Leu Ser  
 320 325 330

Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys Ala Arg Gly Gly  
 335 340 345

Tyr Tyr Ser Tyr Asp Asp Trp Gly Gln Ala Thr Leu Val Thr Val Ser  
 350 355 360 365

Ser Gly Gly Gly Gly Ser Asp Ile Val Met Thr Gln Ser Pro Leu Ser  
 370 375 380

Leu Pro Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser  
 385 390 395

Gln Ser Leu Leu His Ser Lys Gly Asn Thr Tyr Leu Gln Trp Tyr Leu  
 400 405 410

Gln Lys Pro Gly Gln Ser Pro Arg Leu Leu Ile Tyr Lys Val Ser Asn  
 415 420 425

Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr  
 430 435 440 445

Asp Phe Thr Leu Lys Ile Ser Arg Val Glu Ala Asp Asp Val Gly Ile  
 450 455 460

Tyr Tyr Cys Ser Gln Ser Thr His Val Pro Tyr Thr Phe Gly Gln Gly  
 465 470 475

Thr Lys Leu Glu Ile Lys  
 480

<210> 115  
 <211> 4  
 <212> PRT  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic peptide  
  
 <400> 115  
 Gly Gly Gly Ser  
 1

<210> 116  
 <211> 4  
 <212> PRT  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic peptide  
  
 <400> 116  
 Ser Gly Gly Gly  
 1

<210> 117  
 <211> 5  
 <212> PRT  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic peptide  
  
 <400> 117  
 Ser Gly Gly Gly Gly  
 1                      5

<210> 118  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic peptide  
  
 <400> 118  
 Gly Gly Gly Gly Gly Ser  
 1                      5

<210> 119  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 119  
Ser Gly Gly Gly Gly Gly  
1 5

<210> 120  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 120  
Gly Gly Gly Gly Gly Ser  
1 5

<210> 121  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 121  
Ser Gly Gly Gly Gly Gly  
1 5

<210> 122  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<220>  
<221> MOD\_RES  
<222> (5)..(5)  
<223> Any amino acid

<220>  
<221> MOD\_RES  
<222> (11)..(12)  
<223> Any amino acid

<400> 122  
Trp Tyr Leu Gln Xaa Pro Gly Gln Ser Pro Xaa Xaa Leu Ile Thr  
1 5 10 15